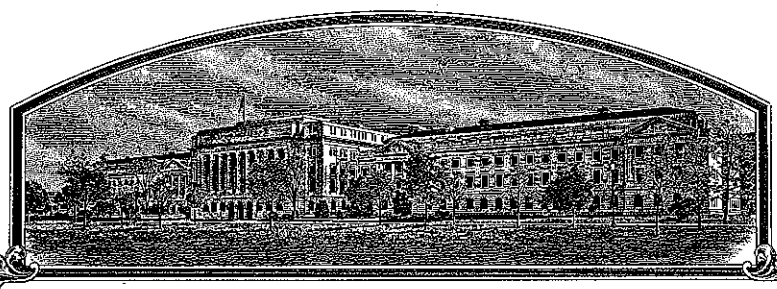
No. 200500103



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Agricultural Experiment Station/ USDA-ARS

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY MAY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUCLEUS SEED GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

RICE

'Cala'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twelfth day of December, in the year two thousand and five.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions*

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER

Texas Agricultural Experiment Station (~~TAES~~)/USDA-ARS RAO 7/18/05

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME

RU 0003006

3. VARIETY NAME

Cala

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*

Dr. Mark A. Hussey
Associate Director, TAES
2147 TAMU
College Station, TX 77843-2147

Anna M. McClung
USDA-ARS
1509 Aggie Dr.
Beaumont, TX 77713

5. TELEPHONE *(include area code)*

(979) 845-4747

6. FAX *(include area code)*

(979) 458-4765

FOR OFFICIAL USE ONLY

PVPO NUMBER

2005 00 103

FILING DATE

Jan. 24, 2005

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*

St. of TX Res. Agency/US Gov't Res. Agency

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*

Janie Hurley
Technology Licensing Manager, Agriculture/Life Sciences
Technology Licensing Office
The Texas A&M University System
3369 TAMU
College Station, TX 77843-3369

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 3,650-
DATE 1/24/2005

CERTIFICATION FEE:
$ 68200
DATE 9-15-05

11. TELEPHONE *(Include area code)*

(979) 847-8682

12. FAX *(Include area code)*

(979) 845-1402

13. E-MAIL

jhurley@tamu.edu

14. CROP KIND *(Common Name)*

Rice

16. FAMILY NAME *(Botanical)*

Gramineae

15. GENUS AND SPECIES NAME OF CROP

Oryza sativa

17. IS THE VARIETY A FIRST GENERATION HYBRID?

☐ YES ☑ NO

18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (*OPTIONAL*)

☐ YES ☑ NO

IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERICALIZATION. _____

19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
(Follow instructions on reverse)

a. ☑ Exhibit A. Origin and Breeding History of the Variety
b. ☑ Exhibit B. Statement of Distinctness
c. ☑ Exhibit C. Objective Description of Variety
d. ☑ Exhibit D. Additional Description of the Variety *(Optional)*
e. ☑ Exhibit E. Statement of the Basis of the Owner's Ownership
f. ☑ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
g. ☑ Filing and Examination Fee ($3,652), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)*

☑ YES *(If "yes", answer items 21 and 22 below)* ☐ NO *(If "no", go to item 23)*

21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?

☑ YES ☐ NO

IF YES, WHICH CLASSES? ☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☑ YES ☐ NO

IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

(If additional explanation is necessary, please use the space indicated on the reverse.)

23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?

☐ YES ☑ NO

IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?

☐ YES ☑ NO

IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER		SIGNATURE OF OWNER	
Mark A Hussey		Anna M. McClung	
NAME *(Please print or type)*		NAME *(Please print or type)*	
Mark A. Hussey		Anna M. McClung	
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
Associate Director, TAES	01-20-05	Research Geneticist	01-10-05

(See reverse for instructions and information collection burden statement)

ST-470 (04-03) designed by the Plant Variety Protection Office using Word 2002.

1

'CALA' RICE

Anna M. McClung
USDA-ARS

William D. Park
Texas A&M University System

'Cala' (*Oryza sativa* L.), a long-grain rice cultivar that is adapted for production to the southern rice growing region, was developed at the Texas A&M University System Agricultural Research and Extension Center at Beaumont, TX, by the USDA-ARS in cooperation with the Texas Agricultural Experiment Station, the Texas Rice Improvement Association, and the Texas Rice Research Foundation.

Exhibit A. ORIGIN AND BREEDING HISTORY

Cala was developed from the cross 'Cypress/Pelde (sel 96:3944)/Jefferson' (cross number 96165), made at the Texas A&M University System Agricultural Research and Extension Center at Beaumont, TX in 1996. Cypress is a semidwarf, long grain cultivar, with superior milling quality that was released in 1992 and has been commercially grown in the southern U.S. It has conventional long grain cooking quality as evidenced by an apparent amylose content of 20-22% and an intermediate alkali spreading value (rating of 4 in 1.7 % KOH). Pelde is an early maturing, conventional height cultivar with rough (pubescent) leaves, lemma and palea. Pelde has a cooking quality which is unique from typical southern U.S. long grains. Its apparent amylose content is approximately 12% and it has a high-intermediate alkali spreading value (rating of 2-3 in 1.7% KOH). This cooking quality is desired by some specialty markets and is found in the cultivars Jacinto and Cadet. However, although Jacinto has better yield than Cadet, both are inferior in productivity as compared to current commercial long grain cultivars. Jefferson is a conventional cooking long grain cultivar that was released in 1996. Jefferson is a semidwarf, has very early maturity, excellent resistance to lodging, and improved resistance to blast (caused by *Pyricularia grisea)* and sheath blight (caused by *Rhizoctonia solani*) diseases. The objective of the cross was to incorporate the unique cooking quality that is found in Pelde (and its offspring Jacinto, Cadet, and Hidalgo) into a cultivar having improved yield, milling quality, and disease resistance.

Cala was developed using a conventional pedigree breeding scheme that was augmented using marker assisted selection. An F_8 panicle from the breeding selection 938A1-20-7-1-2-3 that was derived from a cross of Cypress/Pelde was used to cross with Jefferson in 1996. F_2 seed were produced during the 1996-97 winter in the greenhouse. The F_2 progeny were planted in the Spring 1997 winter nursery facilities located in Lajas, Puerto Rico. Seed from single F_2 plants was harvested as the F_3 generation and was planted in Beaumont during 1997. Leaf tissue was harvested across the F_3 plants derived from each F_2 mother plant and was analyzed using molecular marker RM190 which is associated with the *Waxy* gene. This gene controls granule bound starch synthase and determines grain amylose content. Groups of progeny which did not

posses the desirable allele for the *Waxy* gene (i.e. did not possess the low amylose content allele) were discarded. Single F_3 plants were harvested (F_4 seed) and were planted as family bulks in the winter nursery during Spring 1998 and were tested again for the desirable allele using the RM190 marker. F_5 seed was harvested in Puerto Rico and the bulks were planted in unreplicated yield trials in Beaumont during 1998. Selections were made among progeny using the yield and agronomic data from the unreplicated plots in 1998. A bulk harvested from the 1998 unreplicated plot in Beaumont was planted in the 1999 Beaumont nursery. Panicles were harvested from the 1999 nursery and were planted in the 2000 Spring nursery but the entire nursery was lost due to due to herbicide damage. Thus, the bulk seed harvested from the 1999 Beaumont nursery rows was planted in a strip in Beaumont 2000. This was bulk harvested and a larger strip was planted in Beaumont during 2001 from which 196 panicles were harvested. These panicles were planted in the 2001 Fall nursery in Puerto Rico and panicles were selected from 8 uniform rows for the next generation. From these 8 rows, 124 panicles were planted in Beaumont during 2002 as a headrow purification block. Molecular markers had been run on the previous bulked generation and indicated that the *Pi-z* blast resistance gene was segregating in the population. Tissue was sampled in the 2002 headrow field and 5 F_{10} families were identified as having the *Pi-z* gene using marker MRG 5836v2. The field was observed and rogued for offtypes and panicles were picked from the rows possessing *Pi-z,* then the entire field was bulk harvested (bulk includes a mixture of plants with and without *Pi-z).* This F_{11} seed served as the source for planting the foundation seed field in Beaumont during 2003 (includes a mixture of plants with and without *Pi-z).* In the 2003 Spring nursery planted in Puerto Rico, the 100 *Pi-z* containing F_{11} panicles rows were planted and panicles were picked. In the summer of 2003, 600 F_{12} panicles possessing *Pi-z* were planted in Beaumont in parallel with the 2003 foundation seed field. F_{12} panicle selections derived from the family 96165A4-11-6-BK-BK-BK-BK-52-12- were made and now constitute the pedigree of Cala. Thus, the 2003 foundation seed contained a mixture of seed with and without *Pi-z*, whereas subsequent foundation seed fields will be planted with the pure *Pi-z* containing materials derived from the headrows selected using molecular markers. This is an example where molecular markers allowed recovery of a desirable allele that was present in the population at low levels. The *Pi-z* resistance gene is generally found in medium grain cultivars and is derived from a medium grain parent that is in the pedigree of Jefferson. This gene provides resistance to several additional races of the blast pathogen that is not present in the other parents, Cypress and Pelde. Thus, whether it is present to some degree (as in the 2003 produced foundation field) or entirely (as in the 2003 headrow [i.e. PVP voucher sample] and subsequent foundation fields), it will enhance the natural resistance of the cultivar and will benefit the producer. The number of offtypes in the 2003 foundation seed field was less than 1 in 5000 plants. Cala has appeared to be uniform and stable for the last two generations and no variants have been observed. Replicated yield trials were conducted at four Texas locations in 1999. In 2000, Cala was entered as RU 0003006 into the Uniform Rice Regional Nursery which is planted in Beaumont, TX, Crowley, LA, Stuttgart, AR, Malden, MO and Stoneville, MS. It was tested in this trial through 2003 along with additional replicated trials in Eagle Lake, Ganado, and Bay City TX.

Exhibit B. STATEMENT OF DISTINCTNESS

*** Cala averages 8 days earlier in days to heading as compared to its parent Cypress.**

Site		Location	Cypress	Cala	Cypress	Cala	t Value	Prob>t
1	1999	Bay City, TX	75	71				
2	1999	Beaumont, TX	82	70				
3	1999	Eagle Lake, TX	79	70				
4	1999	Ganado, TX	74	64	78	69	3.58	0.0117
5	2000	Beaumont, TX	83	76				
6	2000	Stuttgart, AR	84	79				
7	2000	Stoneville, MS	86	79				
8	2000	Crowley, LA	90	80				
9	2000	Ganado, TX	72	64				
10	2000	Eagle Lake, TX	84	76				
11	2000	Bay City, TX	75	65	82	74	2.25	0.0441
12	2001	Beaumont, TX	83	78				
13	2001	Stuttgart, AR	84	77				
14	2001	Stoneville, MS	86	74				
15	2001	Crowley, LA	79	73				
16	2001	Malden, MO	79	79				
17	2001	Bay City, TX	80	65				
18	2001	Eagle Lake, TX	80	72				
19	2001	Ganado, TX	77	72	81	74	3.8	0.0019
		Grand Mean	81	73			3.96 (*)	0.0002
		Range	72-90	64-80				

*Overall t test was performed using all data collected from 199-2003 (n=32, see Table 2) whereas individual year t tests were performed using data collected just during the specific year.

- **Cala grain has approximately 13% amylose content as compared to Cypress which has approximately 22% amylose content.** Amylose content is determined by the granule bound starch synthase gene that is associated with the microsatellite marker RM 190. The difference in amylose content between Cala and Cypress is verified by differences at the RM 190 marker (Cala has 120 nt, Cypress has 124 nt). This difference in amylose content results in Cala having atypical cooking quality for southern US long grains as compared to Cypress which has typical cooking quality.

- **Cala is classified as having a high gelatinization temperature as determined by an alkali spreading rating of 2.5 in 1.7% potassium hydroxide where as Cypress is classified as having an intermediate gelatinization temperature as determined by an alkali spreading value of 4 in 1.7% potassium hydroxide.** This difference in alkali spreading value results in Cala having atypical cooking quality for southern US long grains as compared to Cypress which has typical cooking quality.

Hidalgo is a sister line of Cala and is the cultivar that Cala is most similar to.

- **Cala has greater whole grain milling quality as compared to Hidalgo**. Milling quality is determined using 125 g rough rice sample, that is dehulled, milled using a McGill No.2, weighed (total milled rice), and then the whole milled grains are separated out (whole milled rice) using a Clipper Cleaner. This is then converted to a percentage based upon the 125 g of rough rice. Developing a cultivar that produces stable and high milling yields over a diversity of environments is considered desirable. However, because of the labor involved with this measurement, many of the locations where the cultivars have been tested used only one replication to assess milling yield. For this reason the statistical analysis that follows involves 29 data points collected from 7 locations over 5 years.

Whole grain milling yield (%) of Hidalgo and Cala evaluated across 29 Southern US locations during 1999-2003. Statistical comparisons include variety means, variety ranges, t test comparing two varieties, and variety means for each year.

		Means By Year-Loc		Means over Years	
Year	Location	Cala	Hidalgo	Cala	Hidalgo
1999	Bay City, TX	65	65		
1999	Beaumont, TX	64	64		
1999	Eagle Lake, TX	69	68		
1999	Ganado, TX	65	66	65.8	65.8
2000	Bay City, TX	67	66		
2000	Beaumont, TX	61	56		
2000	Crowley, LA	70	67		
2000	Eagle Lake, TX	65	66		
2000	Ganado, TX	68	67		
2000	Stoneville, MS	56	56		
2000	Stuttgart, AR	61	60	64.0	62.6
2001	Beaumont, TX	62	55		
2001	Crowley, LA	68	64		
2001	Eagle Lake, TX	67	65		
2001	Ganado, TX	69	67		
2001	Stoneville, MS	58	54		
2001	Stuttgart, AR	66	65	65.0	61.7
2002	Bay City, TX	70	67		
2002	Beaumont, TX	67	62		
2002	Crowley, LA	72	64		
2002	Eagle Lake, TX	67	61		
2002	Stoneville, MS	60	57		
2002	Stuttgart, AR	68	67	67.3	63.0
2003	Beaumont, TX	65	66		
2003	Crowley, LA	67	69		
2003	Eagle Lake, TX	64	59		
2003	Ganado, TX	63	56		
2003	Stuttgart, AR	71	67		
2003	Stoneville, MS	57	54	64.5	61.8

			t value	Prob>Abs t
Grand Mean	63.67	60.93	2.11	0.0394
Range	56-72	54-69		

- **Unlike Hidalgo, Cala possesses the *Pi-z* blast resistance gene that is found in Jefferson. This gene conveys improved resistance to races IC 17 and IE 1K of *Pyricularia grisea* whereas Hidalgo is more susceptible to these races.**

Reaction of Hidalgo and Cala, along with several other check cultivars, to inoculation trials with blast (*P. grisea*) races IC 17 and IE 1K over two years. Conducted at Beaumont, TX using a scale of 1= highly resistant to ~~8~~ 9 = highly susceptible. RAD 7/18/05

Blast Pathotype

Year	Cultivar	IC-17	IE-1K
01	Jefferson	1	1
01	Cocodrie	1	1
01	Cypress	3	4
01	Saber	1	1
01	Cadet	1	1
01	Jacinto	3	6
01	Cala	6	6
01	Hidalgo	9	7
03	Jefferson	0	0
03	Cocodrie	0	0
03	Cypress	7	2
03	Saber	1	0
03	Cadet	.	.
03	Jacinto	.	.
03	Cala	1	1
03	Hidalgo	7	7

- As noted in Exhibit A, molecular markers (MRG 5836 v2) for the *Pi-z* gene were used to identify panicle rows in the Cala headrow that possessed the resistance gene. Foundation seed produced from this improved source (subsequent to the 2003 foundation seed) will be homogenous for the *Pi-z* resistance gene.

Exhibit C. Objective Description of Variety

See attached form.

Exhibit C

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
Rice (*Oryza sativa*)

NAME OF APPLICANT (S)	TEMPORARY OR EXPERIMENTAL DESIGNATION	VARIETY NAME
~~TAES/USDA-ARS~~ RAD 7/18/05	RU 0003006	Cala

ADDRESS *(Street and No. or RD No., City, State, and Zip Code, Country)*

Texas Agricultural Experiment Station
2147 TAMU
College Station, TX 77843-2147

USDA-ARS
1509 Aggie Dr.
Beaumont, TX 77713

FOR OFFICIAL USE ONLY

PVPO NUMBER

200500103

PLEASE READ ALL INSTRUCTIONS CAREFULLY:

Place the appropriate number that describes the character of this variety in the spaces provided below. These numbers are also code numbers corresponding to descriptors developed by IBGR-IRRI Rice Advisory Committee and the US Rice Crop Advisory Committee. Breeders will demonstrate distinctness more readily by describing as many characters as is possible.

1. MATURITY: Days to Heading (Seedling to 50% Heading)

A. South: (Location: Southern U.S.) at 100 kg/ha (Nitrogen Rate)

75 Number of Days

2 Days Earlier Than Check Variety: Jefferson

75 Days Same As Check Variety: Hidalgo

9 Days Later Than Check Variety: Cadet

1 Maturity Class
1 = Very Early (85 Days or Less) 2 = Early (86 – 100)
3 = Intermediate (101 - 115) 4 = Late (More Than 115)

B. California: (Location: _____) at _____ kg/ha (Nitrogen Rate)

____ Number of Days

____ Days Earlier Than Check Variety: _____

____ Days Same As Check Variety: _____

____ Days Later Than Check Variety: _____

____ Maturity Class
1 = Very Early (90 Days or Less) 2 = Early (91 – 97)
3 = Intermediate (98 - 104) 4 = Late (More Than 104)

2. CULM:

1 Angle (Degrees from Perpendicular after Flowering):
1 = Erect (Less than 30°) 3 = Intermediate (About 45°) 5 = Open (About 60°)
7 = Spreading (More than 60° but the culms do not rest on the ground)
9 = Procumbent (The culm or its lower part rests on the ground surface)

8

2. CULM: (continued)

LENGTH

__9 6 • 0__ cm (Soil level to top of extended panicle on main stem)

__2 • 0__ cm Shorter Than Check Variety: Hidalgo

similar to

Length ~~Same as~~ Check Variety: Cypress

__5 • 0__ cm Longer than Check Variety: Jefferson

__1__ Height Class: 1 = Semidwarf 2 = Short 3 = Medium 4 = Tall

__1__ Internode Color: (After Flowering): 1 = Green 2 = Light Gold 3 = Purple Lines 4 = Purple

__3__ Strength (Lodging Resistance): 1 = Strong (no Lodging) 3 = Moderately Strong (Most Plants Leaning) 5 = Intermediate (Most Plants Lodged) 7 = Weak (Most Plants Flat) 9 = Very Weak (All Plants Flat)

3. FLAG LEAF: (After Heading)

__4 2 • 7__ cm Length __1 6 • 0__ mm Width

__1__ Pubescence: 1 = Glabrous 2 = Intermediate 3 = Pubescent

__1__ Leaf Angle (After Heading): 1 = Erect 3 = Intermediate 5 = Horizontal 7 = Descending

__2__ Blade Color: 1 = Pale Green 2 = Green 3 = Dark Green 4 = Purple Tips 5 = Purple Margins 6 = Purple Blotch 7 = Purple

__1__ Basal Leaf Sheath Color: 1 = Green 2 = Purple Lines 3 = Light Purple 4 = Purple

4. LIGULE:

__1 9 • 1__ mm Length (From base of collar to the tip, at late vegetative stage)

__1__ Color: (Late Vegetative Stage): 1 = White 2 = Purple Lines 3 = Purple

__2__ Shape: 1 = Acute to Acuminate 2 = 2-Cleft 3 = Truncate

__1__ Collar Color (Late Vegetative Stage): 1 = Pale Green 2 = Green 3 = Purple

__1__ Auricle Color (Late Vegetative Stage): 1 = Pale Green 2 = Purple

5. PANICLE:

__2 1 • 4__ cm Length

__5__ Type: 1 = Compact 5 = Intermediate 9 = Open

__2__ Secondary Branching: 1 = Absent 2 = Light 3 = Heavy 4 = Clustering

__3__ Exsertion (Near Maturity): 1 = Less than 90% 2 = 90 – 99% 3 = 100% Exserted

__2__ Axis: 1 = Straight 2 = Droopy

__3__ Shattering: 1 = Very Low (Less Than 1%) 3 = Low (1 – 5%) 5 = Moderate (6 – 25%) 7 = Moderately High (26 – 50%) 9 = High (More than 50%)

__3__ Threshability: 1 = Difficult 2 = Intermediate 3 = Easy

6. GRAIN: (Spikelet)

__0__ Awns (After Full Heading): 0 = Absent 1 = Short and Partly Awned 5 = Short and Fully Awned 7 = Long and Partly Awned 9 = Long and Fully Awned

__2__ Apiculus Color (At Maturity) 1 = White 2 = Straw 3 = Brown (Tawny) 4 = Red 5 = Red Apex 6 = Purple 7 = Purple Apex

__1__ Stigma Color: 1 = White 2 = Light Green 3 = Yellow 4 = Light Purple 5 = Purple

6. GRAIN: (Spikelet)

__0__ Lemma and Palea Color (At Maturity):

0 = Straw; 1 = Gold and/or Gold Furrows on Straw Background; 2 = Brown Spots on Straw (Piebald)
3 = Brown Furrows on Straw; 4 = Brown (Tawny); 5 = Reddish to Light Purple
6 = Purple Spots on Straw; 7 = Purple Furrows on Straw; 8 = Purple
9 = Black; 10 = White

__1__ Lemma and Palea Pubescence: 1 = Glabrous; 2 = Hairs on Lemma Keel; 3 = Hairs on Upper Portion; 4 = Short Hairs; 5 = Long Hairs (Velvety)

__1__ Spikelet Sterility (At Maturity): 1 = Highly Fertile (> 90%); 3 = Fertile (75 – 90%); 5 = Partly Sterile (50 – 74%); 7 = Highly Sterile (< 50% to Trace); 9 = Completely Sterile (0%)

7. GRAIN: (Seed)

__2__ Seed Coat (Bran) Color: 1 = White; 2 = Light Brown; 3 = Speckled Brown; 4 = Brown; 5 = Red; 6 = Variable Purple; 7 = Purple

__1__ Endosperm Type: 1 = Nonglutinous (Nonwaxy); 2 = Glutinous (Waxy); 3 = Indeterminate

__1__ Endosperm Translucency: 1 = Clear; 5 = Intermediate; 9 = Opaque

__0__ Endosperm Chalkiness: 0 = None; 1 = Small (Less than 10% of Sample); 5 = Medium (10 – 20% of Sample); 9 = Large (More than 20% of Sample)

__0__ Scent (Aroma): 0 = Nonscented; 1 = Lightly Scented; 2 = Scented

Shape Class (Length/Width Ratio):

__3__ Paddy: 1 = Short (2.2:1 and Less); 2 = Medium (2.3:1 to 3.3:1); 3 = Long (3.4:1 and More)

__3__ Brown: 1 = Short (2.0:1 and Less); 2 = Medium (2.1:1 to 3.0:1); 3 = Long (3.1:1 and More)

__3__ Milled: 1 = Short (1.9:1 and Less); 2 = Medium (2.0:1 to 2.9:1); 3 = Long (3.0:1 and More)

Measurements:

Grain Form	Length (mm)	Width (mm)	Thickness (mm)	L/W Ratio	1000 Grains (grams)
Paddy	10.4	2.58	1.98	4.02	22.85
Brown	7.57	2.21	1.79	3.43	19.67
Milled	7.45	2.10	1.71	3.55	18.28

____ Milling Quality (% Hulls) 66 Milling Yield (% While Kernel (head) Rice to Rough Rice)

7 % Protien 13 % Amylose

Alkali Spreading Value: 2.5 1.5% KOH Solution 2.5 1.7% KOH Solution

__1__ Gelatination Temperature Type: 1 = High; 5 = Intermediate; 7 = Low

Amylographic Paste Viscosity (Brabender Units)

Peak	Hot Paste	Cooled Paste	"Breakdown" "Setback"

8. RESISTANCE TO LOW TEMPERTURE:

__2__ Germination and Seedling Vigor: 1 = Low; 2 = Medium; 3 = High

__2__ Flowering (Spikelet Fertility): 1 = Low; 2 = Medium; 3 = High

9. SEEDLING VIGOR NOT RELATED TO LOW TEMPERATURE:

__3__ Vigor: 1 = Low; 2 = Medium; 3 = High

10. BLAST RESISTANCE: (*Pyicularia oryzae*). (International races found under References)

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

Group			IB			IC		ID		IE	IG	IH	1 E 1 K	RAO
Number	1	5	45	49	54	1	17	1	13	1	1	1	1	7/18/05
Resistance	___	___	1	9	1	___	1	1	___	1	1	1	1	

11. RESISTANCE TO OTHER DISEASES:

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

1 Narrow Brown Leaf Spot (*Cerospora oryzae*)

1 Leaf Smut (*Entyloma oryzae*)

1 Brown Leaf Spot (*Helminthosporium oryzae*) (=*Bipolaris oryzae*) (=*Drechslera oryzae*)

____ Leaf Scald (*Gerlachia oryzae*)

____ Hoja Blanca Virus

7 Sheath Rot (*Sarocladium oryzae*)

____ Pythium Seedling Blight (*Pythium* sp.)

____ Sheath Spot (*Rhizoctonia oryzae*)

____ Other: _____

____ Aggregate Sheath Spot (*Rhizoctonia oryzae-sativae*)

3 Straight Head

3 Kernel Smut (*Neovossia horrida*) (=*Tilletia barclayana*)

____ White Tip Nematode (*Aphelenchoides besseyi*)

____ Stem Rot (*Sclerotium oryzae*)

____ Bacterial Blight (*Xanthomonas campestris pv. oryzae*)

7 Sheath Blight (*Rhizoctonia solani*)

12. INSECT RESISTANCE:

0 = Immune 1 = Resistant 3 = Moderately Resistant 5 = Intermediate 7 = Moderately Susceptible 9 = Susceptible

____ Grasshopper

____ Rice Leafhopper

____ Rice Hispa

____ Rice Midge

____ Least Skipper

3 Rice Stink Bug (*Oegalus pugnax*)

____ Swarm Caterpillar

3 Rice Water Weevil (*Lissorhoptrus oryzophilus*)

____ Rice Stalk Borer (*Chilo plejadellus*)

____ Sugarcane Borer (*Diatraea saccharalis*)

13. OTHER DESCRIPTORS: If there are other characters that describe this variety, please indicate below:

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B. D. Webb *et al.* 1985. Utilization Characteristics and Qualities of United States Rice. In Proceedings on Rice Grain Quality and Marketing. International Rice Research Institute (IRRI), Los Branos, Philippines. P. 25-35.

Exhibit D. Optional Supporting Information

Cala possesses a semidwarf plant type that is similar to Cypress and Jacinto in height (96 cm = 38 in) and is 2 cm shorter than Hidlago (Table 1). All plant parts are glabrous (smooth), unlike Jacinto which is pubescent. In 32 trials conducted throughout the southern U.S., the average flowering date of Cala is two days earlier than Jefferson and eight days earlier Cypress (Table 2). Thus, Cala is considered a very early maturing cultivar, earlier than its parents. At maturity, the spikelet is straw-colored and awnless. At heading the apiculus is brown and then fades to straw color by maturity. The flag leaf is erect at maturity. Seedling vigor is very good and similar to Cypress.

In 32 tests across the southern U.S. (AR, TX, LA, and MS) during 1999-2003, the average grain yield of Cala was 7396 lb/ac which was greater than Jacinto (6351 lb/ac), similar to Cypress (7245 lb/ac), but less than Cocodrie (8058 lb/ac) (Table 3). This indicates that Cala has yield potential that is competitive with recently released commercial long grains like Cypress and Cocodrie. Cala is more susceptible to lodging than Cypress and Jefferson, but is not as susceptible as Hidalgo (Table 4). However, it is recommended that harvest is conducted on a timely basis and fertilizer is managed well.

Cala also has superior head rice milling quality (66%) as compared other cultivars (Table 5). Its total milling yield (71%) is slightly better than other cultivars and it has excellent test weight (44 lb/bu) (Table 7). A comparison of grain dimensions and kernel weight of Cala (Tables 8 and 9) demonstrates that it has a relatively long grain but is otherwise similar to Hidalgo. Larger grain size is considered desirable in packaged rice.

Cala has a similar level of resistance to the races of blast disease (*Pyricularia grisea*) as Jefferson and is more resistant than Jacinto (Tables 10 and 11). However, in the latter stages of development of Cala, it was found to possess the *Pi-kh* and *Pi-z* blast resistance genes using molecular markers (RM144, RM224, MRG5835v2). Based upon its reaction to races of blast (Table 10) and this molecular marker analysis, the last headrow of Cala is expected to be susceptible to just one race (IB49) of the blast pathogen like its parent, Jefferson. Thus, the final selection of Cala appears to be more resistant to blast disease than Cypress and Jacinto.

Over six years of screening nurseries inoculated with the organism that causes sheath blight, (*Rhizoctonia solani*), Cala demonstrated a similar level of susceptibility as Cocodrie and Hidalgo (rated 6.8) and was slightly more tolerant than Cypress (7.0) and Jacinto (7.2) (Table 12).

Observations of natural incidences of narrow leaf brown spot [*Cercospora janseana* (Racib) O.], brown spot [*Bipolaris oryzae* (B. de Haan) Ellis], leaf smut [*Entyloma oryzae* H. & D. Sydow], panicle blight, and the physiological disorder, straighthead have been limited, but Cala appears to be relatively tolerant to these diseases like Jefferson (data not shown).

The endosperm of Cala is nonglutinous and is covered by a light brown pericarp. Cala has amylose

content of approximately 13% and a high-intermediate alkali spreading value (in 1.7% KOH solution) like Jacinto and Hidalgo. An analysis of the genetic marker associated with the granule bound starch synthase, indicated that Cala has the same *Waxy* allele as Cadet, Jacinto, Hidalgo, and Pelde (data not shown). As a non-processed rice, these cultivars will result in a softer and more sticky cooked product than conventional long grains like Cypress and Cocodrie. However when these grain chemistry properties are coupled with specialized processing, they can be used to produce a quick-cooking brown rice. Thus, development of cultivars with these properties offers consumers the convenience of quick cooking along with the health benefits associated with whole grain brown rice.

REFERENCES

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Fjellstrom, R.G., C.A. Bormans, M.A. Marchetti, A.R. Shank, W.D. Park, and A.M. McClung. 2004. Development of DNA markers suitable for marker assisted selection of three Pi-genes conferring resistance to multiple *Pyricularia grisea* pathotypes. Crop Sci. 44:1790-1798.

Table 1. Mean plant height (cm) of Cala and selected check varieties in Texas, Louisiana, Arkansas, Missouri and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
1999	Bay City, TX	96	86	93	94	90	98	100
	Beaumont, TX	85	92	93	96	86	89	93
	Eagle Lake, TX	90	94	79	103	90	99	101
	Ganado, TX	99	100	104	102	84	103	105
2000	Beaumont, TX	92	99	100	104	102	99	100
	Stuttgart, AR	97	93	92	96	95	99	97
	Stoneville, MS	91	101	99	101	106	98	101
	Crowley, LA	95	97	97	100	96	93	94
	Ganado, TX	93	89	88	92	98	96	99
	Eagle Lake, TX	82	87	85	92	90	86	90
	Bay City, TX	92	99	100	100	97	100	98
2001	Beaumont, TX	94	95	98	97	94	99	98
	Stuttgart, AR	96	95	99	99	98	99	103
	Stoneville, MS	98	99	94	101	98	100	101
	Crowley, LA	91	87	92	93	95	96	99
	Malden, MO	89	95	85	90	94	95	91
	Bay City, TX	84	94	97	101	94	90	91
	Eagle Lake, TX	87	89	84	93	89	94	98
	Ganado, TX	91	96	97	95	93	99	97
2002	Beaumont, TX	92	93	90	94	95	97	95
	Stuttgart, AR	97	98	96	103	104	108	101
	Stoneville, MS	87	95	96	104	101	97	99
	Crowley, LA	83	83	88	87	89	86	90
	Malden, MO	93	95	84	92	101	92	92
	Bay City, TX	87	102	100	107	.	97	94
	Eagle Lake, TX	87	90	88	95	.	91	91
	Ganado, TX	91	96	101	100	.	96	92
2003	Beaumont, TX	86	83	105	103		101	98
	Stuttgart, AR	94	102	105	102	.	102	109
	Crowley, LA	98	101	108	106	.	101	108
	Eagle Lake, TX	86	89	97	102	.	91	94
	Ganado, TX	92	97	97	97	.	96	101
	GRAND Mean	91	94	95	98	95	96	98

Table 2. Mean number of days to 50% heading for Cala and selected check varieties in Texas, Louisiana, Arkansas, Missouri and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
1999	Bay City, TX	69	70	75	75	71	71	70
	Beaumont, TX	71	75	82	79	74	70	70
	Eagle Lake, TX	71	75	79	77	74	70	69
	Ganado, TX	65	67	74	72	66	64	65
2000	Beaumont, TX	73	80	83	81	79	76	76
	Stuttgart, AR	78	84	84	82	82	79	81
	Stoneville, MS	80	84	86	84	82	79	78
	Crowley, LA	83	88	90	87	85	80	81
	Ganado, TX	65	69	72	72	70	64	64
	Eagle Lake, TX	77	79	84	82	68	76	76
	Bay City, TX	66	68	75	71	82	65	65
2001	Beaumont, TX	80	84	83	81	78	78	79
	Stuttgart, AR	96	80	84	81	81	77	77
	Stoneville, MS	98	81	86	84	78	74	77
	Crowley, LA	91	76	79	75	75	73	74
	Malden, MO	89	82	79	78	80	79	80
	Bay City, TX	64	73	80	78	73	65	66
	Eagle Lake, TX	74	84	80	78	76	72	74
	Ganado, TX	72	77	77	78	74	72	71
2002	Beaumont, TX	71	76	80	80	78	71	70
	Stuttgart, AR	91	97	99	99	96	91	93
	Stoneville, MS	77	82	87	84	82	78	79
	Crowley, LA	82	82	85	85	84	83	83
	Malden, MO	93	97	107	104	87	95	92
	Bay City, TX	74	77	81	81	.	74	75
	Eagle Lake, TX	73	78	80	78	.	73	73
	Ganado, TX	67	76	81	81	.	69	66
2003	Beaumont, TX	79	71	80	80	.	70	80
	Stuttgart, AR	86	94	95	91	.	91	88
	Crowley, LA	68	72	73	73		72	71
	Eagle Lake, TX	73	79	81	79	.	78	74
	Ganado, TX	74	76	79	80	.	78	75
	GRAND Mean	77	79	83	81	78	75	75

Table 3. Average main crop yield (LB/AC) for Cala and selected check varieties in Texas, Louisiana, Arkansas, Missouri and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
1999	Bay City, TX	6372	5522	5440	5641	6158	6194	6053
	Beaumont, TX	7295	8471	5986	6979	6501	7739	8867
	Eagle Lake, TX	6948	6306	5549	5436	5340	6417	6621
	Ganado, TX	7352	7035	6787	6149	5801	7628	7237
2000	Beaumont, TX	9359	10200	8754	8920	8713	9220	9578
	Stuttgart, AR	7462	9149	7577	8142	7368	7191	8852
	Stoneville, MS	6951	8796	7741	8628	7461	6553	6832
	Crowley, LA	7813	8125	8076	7184	6881	7988	8038
	Ganado, TX	9359	8577	7368	6416	7244	7541	6826
	Eagle Lake, TX	7907	8299	7265	7035	6600	7064	7602
	Bay City, TX	7753	7325	7256	5948	5920	7113	6952
2001	Beaumont, TX	9508	10245	9054	9682	2349	9622	10421
	Stuttgart, AR	7630	8698	7172	7303	6441	8495	8997
	Stoneville, MS	6820	7237	6150	6580	6291	6949	6124
	Crowley, LA	6717	7380	6888	5210	6986	7026	7626
	Bay City, TX	6675	7452	7052	6593	6404	5568	6993
	Eagle Lake, TX	7258	7712	7397	6246	5646	6371	6591
	Ganado, TX	7001	7536	7573	6967	6894	6757	7400
2002	Beaumont, TX	9528	10399	7354	9345	.	9126	9128
	Stuttgart, AR	7442	7695	6495	6677	5282	7980	8485
	Stoneville, MS	7173	8301	6844	7527	7993	7568	8441
	Crowley, LA	7596	7721	8590	6488	5100	7432	7768
	Bay City, TX	7146	8027	6159	6167	.	6814	7212
	Eagle Lake, TX	8163	7733	7681	7127	.	8102	7766
	Ganado, TX	7391	8355	7037	7760	.	6335	.
2003	Beaumont, TX	6761	7681	6920	7948	.	7256	6960
	Stuttgart, AR	7650	7830	7695	7155	.	8280	8640
	Crowley, LA	6170	8432	8332	6452	.	6938	8139
	Eagle Lake, TX	8393	8532	8561	8226	.	7848	8218
	Ganado, TX	6125	6961	6598	5360	.	6757	6708
	GRAND Mean	7524	8058	7245	7043	6351	7396	7761

Table 4. Average lodging (%) for Cala and selected check varieties in Texas, Louisiana, Arkansas, Missouri and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
2000	Beaumont, TX	3	0	45	0	3	3	8
	Stuttgart, AR	0	0	0	0	0	0	0
	Stoneville, MS	0	0	0	0	0	0	0
	Crowley, LA	0	0	0	0	0	0	43
	Ganado, TX	0	0	0	0	0	17	3
	Eagle Lake, TX	0	7	40	0	30	0	0
	Bay City, TX	7	0	0	0	0	17	17
2001	Beaumont, TX	0	0	0	0	75	0	0
	Stuttgart, AR	0	0	0	0	0	42	22
	Stoneville, MS	17	1	64	26	43	56	86
	Crowley, LA	0	0	0	0	0	0	0
	Bay City, TX	0	0	0	0	38	80	75
	Eagle Lake, TX	1	6	0	0	66	25	75
	Ganado, TX	0	0	0	0	33	0	18
2002	Beaumont, TX	0	0	0	0	45	15	18
	Stuttgart, AR	0	0	0	0	0	0	0
	Stoneville, MS	0	0	95	16	63	0	60
	Crowley, LA	0	0	0	0	65	23	0
	Bay City, TX	0	0	0	0	.	43	67
	Eagle Lake, TX	0	0	0	0	.	0	0
	Ganado, TX	83	17	0	0	.	100	100
2003	Beaumont, TX	0	5	5	0	.	0	0
	Stuttgart, AR	23	53	3	0	.	15	33
	Crowley, LA	0	0	0	0	.	0	0
	Eagle Lake, TX	0	0	5	0	.	27	23
	Ganado, TX	0	0	0	0	.	10	13
	GRAND Mean	5	3	10	2	26	18	25

Table 5. Whole milling yield (%) for Cala and selected check varieties in Texas, Louisiana, Arkansas, and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
1999	Bay City, TX	56	62	64	63	62	65	65
	Beaumont, TX	59	59	53	61	61	64	64
	Eagle Lake, TX	64	63	65	61	63	69	68
	Ganado, TX	54	59	64	59	58	65	66
2000	Beaumont, TX	59	59	60	59	56	61	56
	Stuttgart, AR	45	60	58	43	58	61	60
	Stoneville, MS	46	51	59	59	55	56	56
	Crowley, LA	63	64	61	68	65	70	67
	Ganado, TX	59	61	66	66	64	68	67
	Eagle Lake, TX	57	52	60	58	55	65	66
	Bay City, TX	58	60	54	63	59	67	66
2001	Beaumont, TX	48	49	52	57	52	62	55
	Stuttgart, AR	63	64	67	67	65	66	65
	Stoneville, MS	46	55	54	51	57	58	54
	Crowley, LA	64	65	68	67	66	68	64
	Bay City, TX	59	59	66	62	62	.	61
	Eagle Lake, TX	62	60	65	57	60	67	65
	Ganado, TX	67	65	66	67	58	69	67
2002	Beaumont, TX	63	59	65	66	63	67	62
	Stuttgart, AR	65	68	68	66	69	68	67
	Stoneville, MS	51	56	55	59	51	60	57
	Crowley, LA	67	64	69	70	63	72	64
	Bay City, TX	64	59	62	66	.	70	67
	Eagle Lake, TX	60	56	63	67	.	67	61
	Ganado, TX	62	61	63	67	.	68	66
2003	Beaumont, TX	67	58	63	63	.	65	66
	Stuttgart, AR	64	68	71	67	.	71	67
	Crowley, LA	68	66	69	70	.	67	69
	Eagle Lake, TX	55	54	59	62		64	59
	Ganado, TX	62	56	61	62	.	63	56
	GRAND Mean	59	60	62	62	60	66	63

Table 6. Total milling yield (%) for Cala and selected check varieties in Texas, Louisiana, Arkansas, and Mississippi (1999-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	Cala	Hidalgo
1999	Bay City, TX	72	72	71	69	71	72	72
	Beaumont, TX	69	68	65	67	69	70	70
	Eagle Lake, TX	72	73	72	69	72	73	73
	Ganado, TX	69	71	72	69	71	70	70
2000	Beaumont, TX	68	68	68	66	67	68	66
	Stuttgart, AR	71	72	73	70	71	71	70
	Stoneville, MS	64	65	68	66	67	65	65
	Crowley, LA	73	70	70	71	71	70	74
	Ganado, TX	68	73	73	70	71	74	73
	Eagle Lake, TX	72	70	71	68	70	73	73
	Bay City, TX	72	70	69	68	69	71	70
2001	Beaumont, TX	68	67	67	68	68	71	69
	Stuttgart, AR	69	69	71	69	68	70	70
	Stoneville, MS	68	66	65	65	67	68	66
	Crowley, LA	70	69	71	69	65	71	70
	Bay City, TX	68	69	71	68	70	.	69
	Eagle Lake, TX	70	70	71	68	70	70	70
	Ganado, TX	72	71	73	70	71	72	72
2002	Beaumont, TX	72	71	73	70	73	73	72
	Stuttgart, AR	71	73	71	69	73	72	71
	Stoneville, MS	65	64	63	66	64	65	63
	Crowley, LA	72	69	72	71	68	73	69
	Bay City, TX	70	70	69	69	.	72	72
	Eagle Lake, TX	70	67	70	70	.	71	70
	Ganado, TX	71	71	72	70	.	71	71
2003	Beaumont, TX	74	75	73	70	.	71	73
	Stuttgart, AR	72	72	73	70	.	73	71
	Crowley, LA	72	72	72	71		70	71
	Eagle Lake, TX	70	66	67	67	.	70	68
	Ganado, TX	69	68	69	68	.	68	66
	GRAND Mean	70	70	70	69	69	71	70

Table 7. Average Test Weight (BU/AC) for Cala and selected check varieties in Mississippi and several Texas locations (2000-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Jacinto	Cala	Hidalgo
2000	Stoneville, MS	45	46	46	40	44	44
	Beaumont, TX	49	49	48	42	49	48
	Ganado, TX	42	45	43	37	43	44
	Bay City, TX	45	46	44	39	43	43
	Eagle Lake, TX	47	44	44	38	46	45
2001	Stoneville, MS	41	44	40	34	42	41
	Ganado, TX	44	47	45	37	44	42
	Bay City, TX	42	45	46	40	42	42
	Eagle Lake, TX	45	47	45	37	44	43
2002	Stoneville, MS	43	44	42	36	42	42
	Bay City, TX	43	45	44	.	44	43
	Eagle Lake, TX	40	45	43	.	43	41
2003	Eagle Lake, TX	43	43	45	.	43	40
	Ganado, TX	42	44	44	.	42	40
	GRAND Mean	44	45	44	38	44	43

Table 8. Average kernel weight (mg) for Cala and selected check varieties in Arkansas (2000-2003).

Year	Location	Jefferson	Cocodrie	Cypress	Saber	Jacinto	**Cala**	Hidalgo
2000	Stuttgart, AR	20.27	18.20	18.40	13.60	17.60	19.07	18.00
2001	Stuttgart, AR	18.00	19.33	18.67	14.67	16.00	22.67	20.67
2002	Stuttgart, AR	20.07	18.53	17.93	14.67	16.80	17.27	18.26
2003	Stuttgart, AR	20.30	19.60	17.70	14.90	.	17.20	19.30
	GRAND Mean	19.66	18.92	18.18	14.46	16.80	19.05	19.06

Table 9. Rough, brown, and milled grain dimensions and weight of Hidalgo, Cala, Cypress, and Jacinto long grain rice cultivars grown at Beaumont, TX in 2002.

		Length	Width	Thickness	Weight	L/W ratio
		mm	mm	mm	g/1000 ker	
Hidalgo	Rough	10.32	2.57	1.99	23.77	4.02
	Brown	7.74	2.22	1.74	20.61	3.49
	Milled	7.69	2.10	1.71	18.39	3.66
Cala	**Rough**	**10.36**	**2.58**	**1.98**	**22.85**	**4.02**
	Brown	**7.57**	**2.21**	**1.79**	**19.67**	**3.43**
	Milled	**7.45**	**2.10**	**1.71**	**18.28**	**3.55**
Cypress	Rough	9.56	2.55	2.00	24.18	3.75
	Brown	7.48	2.27	1.81	20.03	3.30
	Milled	7.40	2.19	1.80	18.91	3.38
Jacinto	Rough	10.29	2.57	2.01	20.11	4.00
	Brown	7.36	2.15	1.73	18.71	3.42

Table 10. Comparison for reaction to blast* (*Pyricularia grisea*) in inoculated greenhouse tests conducted at Beaumont, Tx (2001 and 2003).

		Blast Race/Pathotype							
Year	Cultivar	IB-1J	IB-17	IB-49	IB-54	IC-17	IE-1K	IG-1	IH-1
01	Jefferson	.	.	6	0	1	1	0	.
01	Cocodrie	.	.	4	1	1	1	0	.
01	Cypress	.	.	6	2	3	4	1	.
01	Saber	.	.	3	0	1	1	1	.
01	Cadet	.	.	7	0	1	1	0	.
01	Jacinto	.	.	6	0	3	6	7	.
01	**Cala**	**.**	**.**	**7**	**0**	**6**	**6**	**1**	**.**
01	Hidalgo	.	.	5	0	9	7	2	.
03	Jefferson	.	.	7	0	0	0	0	0
03	Cocodrie	.	.	7	0	0	0	0	0
03	Cypress	.	.	7	0	7	2	0	0
03	Saber	.	.	7	0	1	0	0	0
03	Cadet	.	.	.	.	.	.	.	.
03	Jacinto	.	.	.	.	.	.	.	.
03	**Cala**	**.**	**.**	**7**	**0**	**1**	**1**	**0**	**0**
03	Hidalgo	.	.	7	0	7	7	1	4

* Using a scale of 0=no lesions to 8=large water soaked lesions without well-defined borders

Table 11. Comparison for reaction to blast* (*Pyricularia grisea*) in inoculated field plots located at Beaumont, Tx (1999-2003).

Year	Jefferson	Cocodrie	Gulfmont	Kaybonnet	Cypress	Madison	Saber	Dixiebelle	**Cala**	Hidalgo	Cadet	Jacinto
99	1	3	3	1	4	2	1	6	1	4	4	**8**
00	5	5	5	1	6	1	3	7	5	6	6	9
00	5	5	4	1	3	1	3	4	5	4	5	6
01	0	2	6	2	4	2	1	2	2	2	2	6
03	0	2	5	0	4	.	1	6	6	4	.	.
Mean	**2**	**3**	**5**	**1**	**4**	**2**	**2**	**5**	**4**	**4**	**4**	**7**

* Using a scale where 1= very resistant to 9=very susceptible.

Table 12. Comparison for reaction * to sheath blight (*Rhizoctonia solani*) in inoculated field plots located at Texas and Arkansas (1999 - 2003).

Year	Jefferson	Cocodrie	Gulfmont	Kaybonnet	Cypress	Madison	Saber	Dixiebelle	Cala	Hidalgo	Cadet	Jacinto	State
99	5	5	9	.	5	8	3	6	5	6	6	5	TX
00	6	6	8	6	8	6	6	6	5	4	8	9	TX
00	8	7	7	5	6	7	7	8	8	8	.	7	AR
01	7	8	8	6	7	8	5	7	8	8	6	7	TX
02	6	6	7	2	8	6	4	7	6	7	.	8	TX
03	8	9	8	6	8	.	7	8	9	8	.	.	TX
Mean	**6.7**	**6.8**	**7.8**	**5.0**	**7.0**	**7.0**	**5.3**	**7.0**	**6.8**	**6.8**	**6.7**	**7.2**	
Min-Max	**5-8**	**5-9**	**7-9**	**2-6**	**5-8**	**6-8**	**3-7**	**6-8**	**5-9**	**4-8**	**6-8**	**5-9**	

* Using a scale where 1= very resistant to 9=very susceptible.

REPRODUCE LOCALLY. Include form number and edition date on all reproductions. FORM APPROVED - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

Application is required in order to determine if a plant variety protection certificate is to be issued *(7 U.S.C. 2421)*. The information is held confidential until the certificate is issued *(7 U.S.C. 2426)*.

1. NAME OF APPLICANT(S)

Texas Agricultural Experiment Station/USDA-ARS

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

RU 0003006

3. VARIETY NAME

Cala

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

Office of the Director, TAES
2147 TAMU
College Station, TX 77843-2147

USDA-ARS
1509 Aggie Dr.
Beaumont, TX 77713

5. TELEPHONE *(Include area code)*

(979) 845-4747

6. FAX *(Include area code)*

(979) 458-4765

7. PVPO NUMBER

2005 00 103

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. **If no, please explain.** ☑ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? **If no, give name of country.** ☑ YES ☐ NO

10. Is the applicant the original owner? ☑ YES ☐ NO **If no, please answer one of the following:**

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?
☐ YES ☐ NO **If no, give name of country**

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?
☐ YES ☐ NO **If no, give name of country**

11. Additional explanation on ownership *(Trace ownership from original breeder to current owner. Use the reverse for extra space if needed)*:

TAES policy and handbook manual provide that all germplasm and varieties developed by its employees in the course of their duties are owned by TAES. A copy of this policy is provided for your records.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.